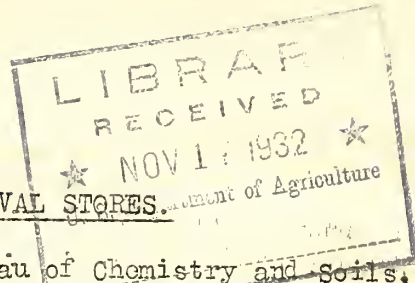


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SCIENCE SERVES PRODUCERS AND USERS OF NAVAL STORES

A radio talk by Dr. Henry G. Knight, Chief, Bureau of Chemistry and Soils, delivered in the Department of Agriculture period, National Farm and Home Hour Friday, November 4, 1932, broadcast by a network of 48 associate NBC radio stations.

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SALISBURY:

Dr. Henry G. Knight, the chief of the Bureau of Chemistry and Soils, comes back to the Farm and Home Hour microphone today after an absence of a week. I may explain to any newcomers in the Farm and Home audience that Dr. Knight is sending us a weekly report on chemical and other research of the Department of Agriculture serving producers and users of the major farm and forest products.

Dr. Knight will give us today a summary of the results of chemical investigations into the production and uses of naval stores. This term naval stores simply means the chemical products of the pine tree, chiefly turpentine and rosin. The production of naval stores is a big farm industry in the Southern Seaboard States from North Carolina to Texas. In normal times the annual value of the output of naval stores is 50 to 60 million dollars. Three hundred thousand people gain their living from the naval stores industry. Exports of naval stores represent half of the value of our total exports of chemicals. We produce about two-thirds of the world supply.

I think these facts will show you why the Congress has directed the Department of Agriculture to carry on research in methods of producing and using naval stores.

Now, Dr. Knight, will you tell us the story of the results of these researches and your plans for future research? Ladies and gentlemen, Dr. Henry G. Knight.

KNIGHT:

Thank you, Salisbury. I'm glad to visit again with you and with the Farm and Home Hour audience.

Now Salisbury didn't indicate to you how many of the articles that you use every day include some products of the naval stores industry. For instance, our newspapers are sized with rosin and are usually printed with ink containing rosin oil.

Turpentine is equally indispensable to the manufacture of many things in household use. For example, your toilet soap may be perfumed with terpineol, a chemical product of turpentine, which has the odor of lilacs.

I could continue with a list of scores of common products made partly from turpentine and rosin.

Now another thing Salisbury didn't explain to you Northerners -- I know we don't need to explain to Southern people -- is the fact that all of the naval

(over)

stores produced in this country come from oleo-resin or gum extracted from living pine trees, or from pine wood.

All of you who live in the South or Northern people who have traveled through the South have seen thousands of trees with a deep scar, shaped something like a sergeant's chevrons turned upside down, cut into the sap wood.

If you've been in the South during the season for collecting the gum, you have seen it oozing from the newly cut part of the sap wood, at the top of the chevron-shaped scar, and dripping from the protruding "V"-shaped edge of bark upon a metal apron or gutter, then flowing down the gutter into clay or metal cups.

Now this gum is the raw material of the naval stores industry. And the industry consists in distilling the gum so as to separate the turpentine from the rosin.

Well, now that you people not familiar with the South Atlantic and Gulf Coast country have some idea of how the naval stores industry is carried on, I'll go ahead and explain to you why we carry on research, the results of our recent research, and the problems that we are tackling in our present research.

The main reason for carrying on research has already been given you by Salisbury. Three hundred thousand people depend for their living upon the naval stores industry. The industry is carried on in small units, by individuals and small firms who own or lease small tracts of pine forests. Obviously, these small producers can't carry on their own research. We are carrying it on for them.

Now let's go back to the beginning of the process, the collection of the oleo-resin, or gum from the trees, and see where research has enabled producers to improve their process and thus eliminate waste and lower costs.

You remember, you people who have never seen the process, that I told you how the gum drips from the newly cut sap wood of the trees onto a metal apron or gutter which directs the flow into clay or metal cups.

Now in this process the gum may pick up rust specks from the gutter and the metal cup. Our chemical research has shown that even small traces of iron reduce the grade of rosin, so that producers will profit by using non-rusting cups and aprons in collecting the gum. This one piece of research work has an estimated potential value to producers of 150 thousand dollars annually.

There always has been heavy losses because of faulty design and setting and operation of stills and condensers and separators. Poor setting or poor operation of stills may increase the use of fuel, and turn out scorched rosin or rosin with turpentine left in it. Poorly designed condensers and separators may lose turpentine by evaporation. So we have drawn plans and specifications for the setting of fire stills so as to cut down fuel costs; to avoid losses of turpentine, and scorching of rosin. We also have developed and introduced an improved method for controlling still operation. This method has brought producers higher yields of turpentine and better grades of rosin.

The producer stands to lose heavily if the rosin that he puts on the market is not graded properly by the buyer. We worked at this problem early in our program of naval stores research and one of the most important results of our work



was the development of definite and permanent glass color standards for rosin. You see, before we developed these glass color standards, buyers graded rosin by comparing it with type cubes cut from other rosin, arbitrarily selected by the grader as representing the various degrees of color -- the indication of quality in rosin. Since the color of these type cubes faded on exposure to light, and since also the types used by different graders varied as to color, there was confusion and controversy in the grading of rosin. All that has passed away since we developed the glass types as color standards. They are now the legal standards of the United States and also have been adopted abroad as the standards for the world's trade in rosin. Members of the naval stores trade conservatively estimate the value of these standards at a hundred thousand dollars annually.

Incidentally, our investigations in connection with the preparation of the color standards revealed wide-spread misgrading of rosin, and adulteration of turpentine. As a result, Congress passed the Naval Stores Act which regulates the sale of turpentine and rosin and protects both producer and consumer.

Our research on turpentine has revealed means of stopping the serious losses due to seepage and leakage of turpentine from wooden barrels not properly coated, and also to deterioration of turpentine not stored under proper conditions. We have developed and introduced an improved method of gluing turpentine barrels which has greatly reduced the loss of turpentine by leakage. And we have shown how to store turpentine for two years or more without serious deterioration.

Well, so much for the past. Now we're going ahead for research on naval stores. We are working at the chemical laboratory in Washington, and at the recently completed field experimental station in the Osceola National Forest near Lake City, Florida. By the way, this station will be dedicated this month, Friday, November 18. Speaking in behalf of the Department of Agriculture I give all of you who are interested a cordial invitation to attend. Our Florida staff is working in cooperation with the research men of the Forest Service.

Here are some of the problems we hope to solve with consequent saving to producers and users of naval stores.

The problem of improving the design of cups and aprons so as to cut down the loss of 10 million dollars annually that result from evaporation of turpentine out of the raw gum.

The problem of improving the equipment for removing fine dirt from the raw gum. Poor straining of the gum costs producers thousands of dollars annually.

The problem of improving the lay-out and location of stills and condensers to cut down the losses in production; to increase the quality of products; and to lower the cost of insurance. Poor location and faulty lay-out now cost individual operators thousands of dollars each year.

The problem of eliminating wastes around the still, such as the practice of throwing away or burning the rosin which sticks to the trash in the gum. This loss amounts to several hundreds of thousands of dollars a year, for one operator may lose as much as 50 pounds of rosin from one charge in this way.

The problem of improving the coatings for the inside of turpentine containers to stop the present annual leakage of 60 thousand dollars worth of turpentine and

the bigger losses due to discoloration of turpentine through contact with uncoated metal.

Finally, the problem of widening the market for naval stores by finding new uses for them in the chemical industries. Among the possibilities we are investigating are the development of processes for the manufacture in this country of synthetic camphor, synthetic rubber, and synthetic perfume from turpentine.

And now, may I say to all of you in this audience who are producers of naval stores, that the results of our research work are yours. If you are not now using them, we invite you to get in touch with the Bureau of Chemistry and Soils, Washington, D. C. We shall be glad to send publications reporting results of research. Periodically, the naval stores experts of the Bureau go on tour to visit individual operations and apply the results of our research to solving individual problems and improving equipment, practices, and processes. One or both of these services from the Bureau are available to all producers of naval stores.

I shall visit with you again on the Farm and Home Hour next Wednesday, November 9. Since next week is National Honey Week, I think I'll report to you the results of research on honey. Goodbye until next Wednesday.